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The Role of Cooperative in The Milk Value Chain in West Bandung Regency, West Java Province

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ABSTRACT

The objective of the study was to evaluate the capacity of Northern Bandung Dairy Farmer Cooperative (KPSBU) to support farmers in producing good quality milk within the milk value chain in West Bandung Regency, West Java. The study used qualitative research strategies including desk study, case study, and focus group discussions. The study compared the involvement of three milk collecting actors that were classified into large cooperative (KPSBU), small cooperative (KUD Puspa Mekar), and private company (Bina Kitri Bersama). A total of 18 dairy farmers, 3 milk collecting actors, 2 milk processors, and one livestock officer were interviewed. Three focus group discussions were conducted. The large cooperative performed better in services, milk collection, and milk quality assessment compared to other milk collecting actors. Members' commitment, inconsistent milk quality, and shortage of good quality fodder were the hindering factors that influenced the collection of good quality milk in the large cooperative. In conclusion, the large cooperative had better performance in service provision, it also had better infrastructures in milk collection and milk quality assessment compared to other milk collecting actors. Increasing the milk quality standard by milk processing companies affected the milk price since 2000.

Keywords: dairy farmer, cooperative, milk quality, milk value chain, value chain governance

ABSTRAK

Penelitian dilakukan untuk mengevaluasi kinerja Koperasi Peternakan Susu Bandung Utara (KPSBU) dalam mendukung peternak untuk memproduksi susu yang berkualitas baik dalam rantai tata nilai susu di Kabupaten Bandung Barat, Jawa Barat. Penelitian ini menggunakan metode kualitatif meliputi studi literatur, studi kasus, dan diskusi kelompok terfokus. Penelitian dilakukan dengan membandingkan aktivitas dari tiga aktor yang terlibat dalam proses distribusi susu yang diklasifikasikan ke dalam koperasi besar (KPSBU), koperasi kecil (KUD Puspa Mekar), dan perusahaan swasta (Bina Kitri Bersama). Wawancara dilakukan kepada 18 peternak sapi perah, 3 kolektor susu, 2 perusahaan pengolahan susu, dan Dinas Peternakan Kabupaten Bandung Barat. Disamping itu juga dilakukan 3 diskusi kelompok terfokus. Hasil penelitian menunjukkan bahwa koperasi besar memberikan pelayanan yang lebih baik terutama dalam proses pengumpulan dan penilaian kualitas susu dibandingkan dengan dua aktor lainnya. Komitmen anggota, fluktuasi kualitas susu dan kekurangan pakan berkualitas merupakan faktor penghambat yang mempengaruhi kualitas susu di koperasi besar. Meningkatnya standar kualitas susu oleh perusahaan pengolahan susu telah mempengaruhi harga susu semenjak tahun 2000. Disimpulkan bahwa koperasi besar memiliki performa yang lebih baik dalam penyediaan layanan, infrastruktur penampungan susu dan penilaian kualitas susu yang lebih baik dibandingkan dengan kolektor susu yang lain.

Kata kunci: peternak sapi perah, koperasi, kualitas susu, rantai nilai susu, value chain governance

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INTRODUCTION

Demand for milk and milk products in Indonesia is rising fastly, due to population growth, increasing purchasing power and new consumers' preferences for dairy products. In 2013, the total population of dairy cows has reached 622,000 heads producing 1,018 thousand tonnes milk per year, which represents a 23% increasement in milk quantities since 2009 (DJPKEH, 2013). Local fresh milk supplied 22% of the total milk supply in the country, the rest being provided by imports of various products and raw materials (Priyanti & Soedjana, 2015).

Milk is mainly produced by smallholder dairy farmers, organized in a large number of cooperatives. Over 90% of the fresh milk is collected through village cooperatives (KUD) and supplied to milk processing industries. The rest is collected through private collectors. Java island contributed for nearly 99% of the total milk production. About 100 dairy cooperatives operate in Java as a whole, involving almost 100,000 dairy farmers members, and delivering the milk to more than 30 milk processing companies. Most of those cooperatives are members of the Indonesian Union of Dairy Cooperatives (GKSI) (Morey, 2011). Dairy cooperatives have a crucial and active role in the milk value chain in encouraging the dairy industry as most of the small scale dairy farmers are organized through cooperatives. Value chain is coordinated value-adding activities that link producers to the end consumers. The firms add values in a coordinated way from the raw materials to the final products adding value at each level in a profitable and sustainable ways (FAO, 2014). However, dairy farming system and the whole dairy chain face many technical and institutional limitations. The farmers are not able to get premium price, while the cooperatives are not able to get quality and reliable supply of milk from the farmers. As the milk quality is directly linked to the low milk price the farmers and the cooperatives get, it led to the dependency of farmers and cooperatives on the processors. Furthermore, the farmers and the cooperatives always depend on the processors for their milk price. The farmers and the cooperatives have no influence on decision making of the milk price. As such, evaluating the capacity of KPSBU as a large cooperatives that supports farmers to produce good quality milk is a priority research question. Answering to it can help to identify key technical or institutional innovations to develop the dairy business in this region.

METHODS

The study was carried out in West Bandung Regency, West Java Province. The West Java province is the second province in terms of milk output: it produces 1/3 of the national production. The province hosts totally around 23 cooperatives, including in particular the Southern Bandung Dairy Farmer Cooperative (KPBS) based in Pangalengan, and the Northern Bandung Dairy Farmer Cooperative (KPSBU) based in Lembang. Those are the 2 largest cooperatives in terms of milk collection

in the Province. West Bandung Regency had more than 7000 dairy farmers in 2015. Most dairy farmers were members of KPSBU, and the remaining ones sold their milk either to some other cooperatives or to private collectors.

Data Collection

There were 2 types of milk collecting actors involved in West Bandung District, the dairy cooperatives and private milk collecting companies. In this study, the milk collecting actors were classified into large cooperative (KPSBU), small cooperative (KUD Puspa Mekar) and private collectors (Bina Kitri Bersama/BKB) (Table 1). In each class, six farmers were individually interviewed. Three focus group discussion were conducted, with six farmers each. The farmers who had been interviewed individually were not involved in focus group discussion. The milk collecting actors identified which individuals and groups of dairy farmers to choose for the interviews. The milk collecting actors explained that it was based on the access and location of the dairy farmers, the ability of the farmers to speak in Bahasa and the time availability of the farmers. In addition, six experts were interviewed. In order to understand the activities done by different stakeholders in the milk value chain, keen observation was required.

Data Analysis

The stakeholder matrix and value chain map were used to analyze general information of the milk value chain. Comparison matrix of milk collecting actors was used to analyze the findings of organisational, economic and members level. The organisation level concentrates on how the organisation works and link with the stakeholders in the milk value chain. The economic level helps to explore the role of the stakeholders and how the cooperative performs in the business environment. The members' level assisted to explain and compared the existing variations in services delivery, milk collection and milk quality assessment among the members.

Table 1. Respondent category and numbers

Category of respondent	Numbers of respondents
Producers affiliated to large cooperative	6
Producers affiliated to small cooperative	6
Producers selling to private collectors	6
Large cooperative (staff)	1
Small cooperative (staff)	1
Private collector (staff)	1
Government livestock services (staff)	1
Milk processing companies (staff)	2
Total	24

RESULTS

The stakeholder analysis and milk value chain map are shown in Table 2 and Figure 1.

Chain Governance of Milk Collecting Actors

Value chain governance is the correlation among stakeholders to control the product requirement within the chain, which includes activities to regulate and implement the parameters. The study defined governance into the dimensions activities, membership, coordination and regulations (Table 3).

Milk Collection and Milk Quality

The members of the dairy cooperatives were divided into several cooperative service places (CSP). This division was based on the region of the farmers. Farmers in CSP were further subdivided into several temporary milk group for determining milk prices. CSP was the first collection point to trace the source of milk. Each CSP had its own milk collection point (Table 4).

Milk Payment and Milk Price

All the milk collecting actors followed the same payment process every month. The price of milk was de-

Table 2. Stakeholders involvement in milk value chain in West Bandung Regency

No.	Stakeholders	Activities
A	Actors	
1	Input suppliers: Artificial insemination centre – Lembang (BIB Lembang) Animal feed companies, KUD Agro vet companies Farm equipment companies Cattle Breeders	Provide frozen semen. Sell cattle concentrate. Sell veterinary medicine. Sell farm equipment. Sell dairy cattle replacement stocks.
2	Milk producers Small holder dairy farmers: Mostly family farms	As dairy farmers, the producers have to make sure that their farms are able to supply milk daily to the milk collectors.
3	Milk collectors: Dairy cooperatives (KPSBU, KUD Puspa Mekar, KUD Sarwa Mukti) Private milk collecting companies (Bina Kitri Bersama, PT Agro Mandiri, CV Barokah, Lambada and Tugu Mandiri)	Milk collection, link farmers to the processors and small scale processing, provide services to their members. Collect milk from non-cooperatives farmers, sell milk to processing plants, and provide services to their members.
4	Small-scale and large milk processors (PT Insan Muda Berdikari, Serba Susu, PT Alfa, PT Indolakto, PT Frisian Flag Indonesia, PT Diamond Cold Storage, PT Yummy Food Utama, PT Nutrifood, PT Cisarua Mountain Dairy)	Process milk into UHT milk, pasteurized milk, cheese, ice cream, yoghurt and sell their products to the customers and consumers.
5	Retailers Hotel, supermarkets	Sell fresh milk and processed milk to the end consumers
6	Consumers	Purchase the products from supermarkets or directly from milk collectors' supermarkets and consume them with or without processing.
B	Supporters and Influencers	
1	NGO's, international / national organisations (Biru, Sahabat Cipta Foundation)	Technical and financial support in the milk value chain, capacity building of farmers and extensions
2	Governments: Ministry of Cooperatives Ministry of Forestry Ministry of Agriculture Financial institutions (Ministry of Finance, Bank BRI, Bank BCA, Bank Jabar) Indonesian Dairy Cooperatives Union (GKSI) Universities (Padjajaran University, Bogor Agricultural University)	Authorization of cooperative establishment Provide land for forage to limited cooperative members Provide technical and non-technical services to few members and policy formulation to all of the actors. Provide subsidy for credit interest to selected cooperative members, loan and saving accounts to some members. Organizing farmers' cooperative and negotiate selling prices on behalf of their primary cooperatives and provide services such as training, financial audits and other business services Doing consultancy on dairy development, conduct research and capacity building

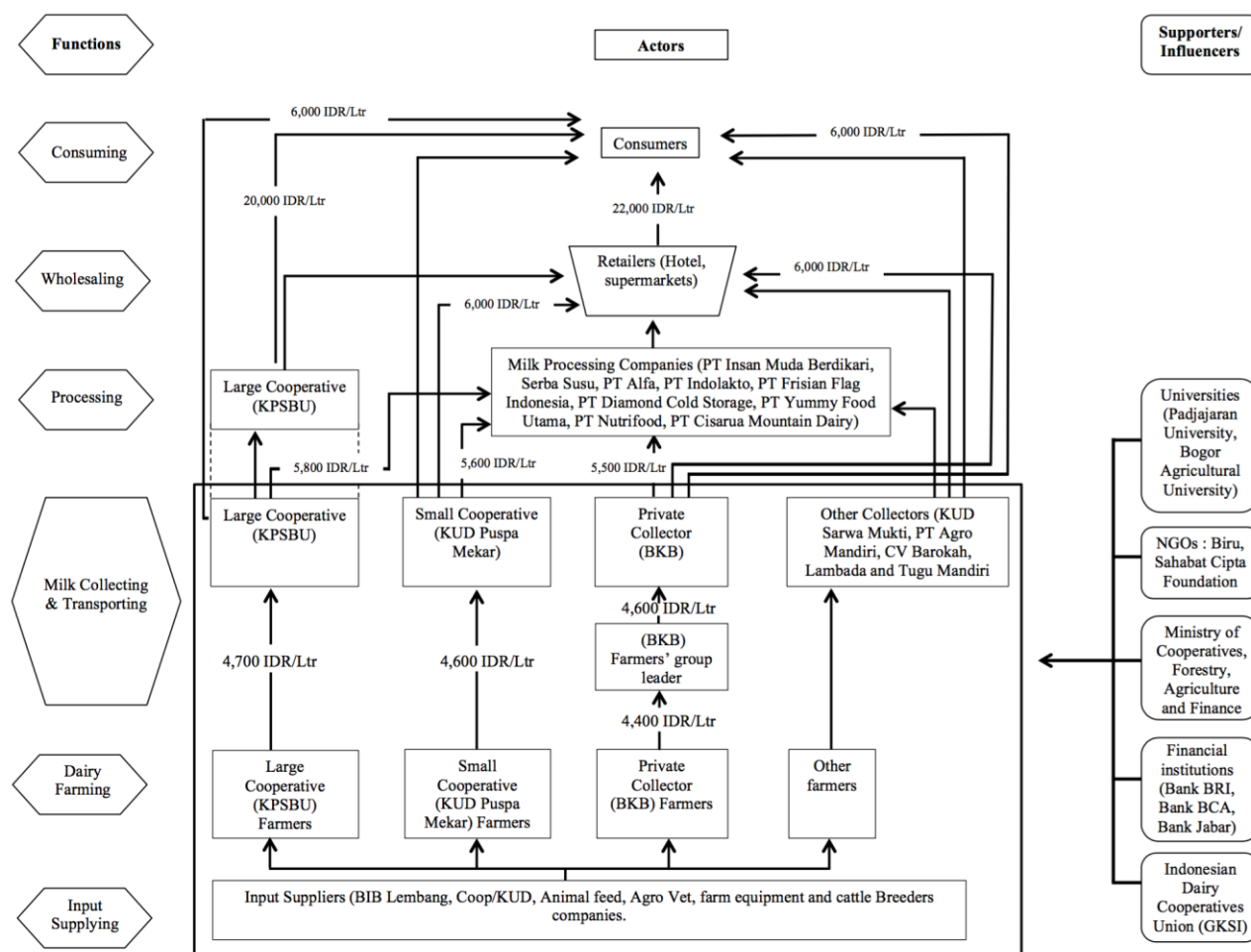


Figure 1. The milk chain map in West Bandung Regency

Table 3. The governance of milk collecting actors in West Bandung Regency

Parameters	Large cooperative	Small cooperative	Private collectors
a. Main activities	Collecting milk	Collecting milk	Collecting milk
b. Membership	7,190 members in 2015	466 members in 2015	200 members in 2015
c. Coordination	Captive type while the relationship with farmers was based on trust.	Captive type while the relationship with farmers was based on trust.	Captive type while the relationship with farmers was based on trust.
d. Regulation	Official legal standard required by the milk processing companies. Bonus provided.	Milk processor required official legal standard. Bonus was provided.	Official legal standard required by the milk processing companies. No bonus provided

Comparison:

- The large cooperative had the highest number of members.
- To meet the requirement, each cooperatives and private collectors had their own standard rules and regulations on milk quality standard.

terminated on the quality of milk and paid in cash twice a month. The quality criteria confirmed by Foreman & de Leeuw (2013) who said that fat, protein and total solids content of the milk are the chemical compositions considered for payment criteria. The farmers' group leaders went to milk collecting actors' offices and received the money on behalf of the members. The group leaders

distributed the money to the group members based on the quantity and quality of milk deposited (Table 5).

Financial Management and Services Provided

The sale of milk was the main source of income for the milk collecting actors. Other sources of income

Table 4. Milk collection and milk quality of milk collecting actors

	Large cooperative	Small cooperative	Private collectors
Milk collection			
a. Farmers level	At the milk collection shed, staff recorded the total volume of milk and checked the quality of milk physically from each farmer. Randomly checked was done 4 times in 2 weeks to check the quality at the laboratory and set the price.	There is no milk collection shed. Staff recorded the amount of milk and checked the quality of milk physically. Randomly checked was done 4 times in 2 weeks to check the quality and set the price.	The farmers' group leaders collected the milk from their members, record the milk quantity of each farmer and deliver the milk to the cooling centre. The milk quality checking was done as and when required.
b. Cooling centres	Milk was transferred from trucks by pumps, then filtered and stored in big tanks to be cooled at 4° C. Sample of milk was checked in the laboratory and the result was reported. Bacterial activity tested. Comparison: The large cooperative had better infrastructure compared to others. Both cooperatives had strict procedures compared to the private collectors. There was no quality checking at the farmers level for the private collectors.	Milk was transferred from trucks by pumps, then filtered and stored in cooling unit to be cooled at 4° C. Sample of milk was checked in the laboratory. No bacterial activity tested.	Staff of the private company recorded the milk quantity and checked the milk quality then stored the milk into cooling unit. No bacterial activity tested.
Milk quality			
a. Total solids	11.87%	11.80%	11.70%
b. Total bacteria	0.88 million cfu/mL	1.4 million cfu/mL	2 million cfu/mL
	Comparison: The large cooperative had better quality because of the bacterial content was less than the others where the private company still had high number of bacteria content.		

Table 5. Milk price of milk collecting actors

Parameters	Large cooperative	Small cooperative	Private collectors
Milk price (IDR)			
a. Farmers level	4,700	4,600	4,400
b. Farmers' group leader level	4,700	4,600	4,600
	Comparison: There was a different milk price between farmers and group leader of farmers in the private company. This was due to the group leaders having to collect milk from each farmer by their own and transport the milk to the cooling centres.		

included the sale of concentrates, processed milk products, daily groceries and dairy farming. The profit generated by the large cooperative from selling milk was used to cover operational costs like staff salary and maintenance of infrastructure. Other sources of funding were received as loans from financial institutions, grants from national or international organisations, grants from NGOs, government and corporate social responsibility programs of private companies. Some funding and income were also subsidize to provide services (Table 6).

DISCUSSION

The large cooperative was able to run its function properly in marketing of farmers' milk. Moustier *et al.* (2010) said that farmer's organizations, in a role of intermediaries, are able to connect the farmers and supermarkets by providing economies of scale and specialized skills in assembling, grading, and transfer-

ring information between buyers and sellers. Mangnus & Piers (2010) also said that producer organizations can play a role in facilitating private sectors and small scale producers in improving their business relation. The large and the small cooperative supplied 80 % and 6 % of the milk respectively, while the remaining milk was supplied by private companies. There was a huge difference in the price of fresh milk at consumers' level between the milk sold by processing companies compared to milk collecting actors (Figure 1). The difference in price is due to the tetra packaging of milk from the processing companies while the milk sold in plastic package are from other milk collecting actors. Tetra packaged milk from milk processing companies were sold in supermarkets, while the plastic packaged milk were sold to the consumers directly on the spot.

The large cooperative had the highest number of members. Coordination between farmers and milk collecting actors was semi-formal where the information

Table 6. Services provided of milk collecting actors

Services	Large cooperative	Small cooperative	Private collectors
a. Livestock services	The cooperatives provided feed concentrate on credit basis, veterinary services, training and extension	The cooperatives provided feed concentrate on credit basis, veterinary services, training and extension	Only provided veterinary services, training and extension
b. Financial services	Provided scholarship for farmers' children education, loan with 0% interest rate and supported farmers in applying for credit program with Banks	Provided loan with 0.4 % interest rate and supported farmers in applying for credit program	Provided loan with 1.5% interest rate
c. Social services	Provided groceries store and farmers health care	Provided groceries store	No services offered
Comparison:			
<ul style="list-style-type: none"> • The private collectors provided loans with the highest interest rate compared to others • Both cooperatives provided feed concentrate and credits with low interest rates; they also supported farmers in accessing credit from bank, and with the groceries store. • Only the large cooperative provided scholarships for the farmers' children education and health care. 			

flow was flexible. KIT & IIRR (2008) said that coordination is a major element in strengthening chain relation. A lead firm is crucial in coordination and organizing the value chain. However, the relation between the cooperatives and dairy farmers was based on trust and commitment between each other. It was also found that farmers sometimes breached the trust and commitments in a bid to gain short-term profits such as adulteration. Therefore, to solve this problem, a written (and legal) contract seem to be crucial. Contract farming requires close supervision to control and maintain product quality that can benefit the farmers' productivity including quality and quantity (Eaton & Shepherd, 2001). It can also guarantee both parties to achieve product consistency.

All the milk collecting actors applied usual standards determined by leading milk processing companies. According to M4P (2008), coordination structures, rules and regulations are the dimensions of the value chain governance. Actors will collaborate to set, monitor and facilitate these parameters by certain agreement. To meet requirements, both cooperatives and the private company had their own standard rules and regulations on milk quality. Some interventions to meet the product requirements were initiated by the large cooperative (supplier) along with the milk processing companies (buyers). Nevertheless, the large cooperative still had difficulties to fulfil the increasing standards of milk processors every year because of the inconsistent capability of the dairy farmers to produce good quality of milk. Food trade development, especially demand for agricultural products with high quality standards is increasing with increased food safety standards of market demands (Tallontire *et al.*, 2011). Therefore, private standards increased the requirement for agri food products to assure supply to market.

Despite having met the national standards, the large cooperative could not adequately regulate the milk quality of its members. Decreasing total solids, adulteration, higher plate count and antibiotics were

still common. Some farmers were not aware of milk hygienic handling practices. They still used plastic buckets to store the milk. Plastic buckets according to Prihutomo *et al.* (2015) are the largest contributor of high bacterial contamination in milk. Polypropylene plastic bucket can spread the residue caused by the physical and chemical properties of these materials by food products, especially milk. This observation also found that there was poor sanitation of milking equipment and milking procedures.

Eventhough milk from the large cooperative had less bacterial content compared to other milk collecting actors, the price margin obtained by the large cooperative from the milk processing companies was very small. Similar finding was reported by Wouters (2009), who stated that the competition for the supply of raw milk and raw milk quality was the major problem in Indonesia. The author confirmed that the milk quality-based payment schemes were introduced, yet the price differences were very small. The large cooperative depended on milk processing companies as the buyers, the processing companies determined the price and fixed product requirements. Nugroho (2012) reported that the domestic milk price depends on the price of milk worldwide. But the price of fresh milk is totally dependent on the interests of milk processing companies. This led to less bargaining power for the suppliers. Understanding the lead firm regulation setting can help micro and small enterprises and other firms to integrate and coordinate their activities to develop their business performance (Trebbin, 2014). It was found that the buyers did not renew the milk price every three months as per the renewal requirement set by the Indonesian government. This led to fixed payments to farmers for a long period of time despite changes in cost of production over time. Due to the asymmetry power where buyers have control over the price and product requirements, the dairy processing industries have not been able to enforce the decision on the milk price.

All respondents shared the view that the large cooperative was very transparent on financial transactions and accounting, and had full trust in the cooperative's financial management. Trust is required to secure a credible commitment from different parties to cooperate on mutually beneficial actions and investment (Nguyen & Tran 2014). Though the turnover of the large cooperative was huge, the net income was very low. This is attributed to the repayment of milk to the members. The cooperative only earned a small margin after adding value to the milk. Eventhough the large cooperative tried to diversify the income sources through sale of dairy cow feed and sett up grocery shops, the cost of raw materials was too high for substantial additional income. The net income from the processed milk looks promising. But the large cooperative only processed a small quantity of milk due to limitation on equipment and staff. Zott & Amit (2010) said that the innovation is a strategic tool that has special characteristic, which is difficult to copy by other competitors that will indicate the sustainability of the business.

Wongtschowski *et al.* (2013) said that three main types of actors who are involved in the business services are clients, service providers, and financiers. All the respondents agreed that the services provided by the large cooperative were adequate. Different social and member welfare services were provided but technical services were hardly provided to the members. Both the large cooperative and the members did not focus on sustainability of the business such as fodder availability : the total number of members remained stagnant or were declining. Providing comprehensive services could help build farmers commitment as stated by Borda-Rodriguez & Vicari (2014). In order to increase the milk quantity, the large cooperative members should be trained by the cooperative experts on fodder production that will help them to improve forage productivity. The large cooperative could also work in collaboration with the Ministry of Agriculture and other related service providers i.e. universities and NGOs to deliver these trainings (Sembada *et al.*, 2016). Achchuthan & Kajanathan (2012) mentioned that besides milk marketing, milk collectors also provide services that aim to increase the business of the farmers. It is also supported by Zheng *et al.* (2011) who said that in order to increase the benefits of the farmers, it needs support from other stakeholders to better link farmers to market in a sustainable way. Therefore, the large cooperative needs to revise the contract with the Ministry of Forestry and negotiate the opportunity to lease more land to its members to solve the fodder shortage. In addition, private land which is left fallow could also be leased to the dairy farmers for fodder production.

CONCLUSION

Milk collecting actors played an active role in various activities in the milk value chain. The large cooperative had better performance in service provision, it also had better infrastructures in milk collection and milk quality assessment compared to other milk collecting actors. Nevertheless, the large cooperative was not the

only milk collecting actors in West Bandung Regency. Hence, other factors must be taken into account in the farmers' choices for one or another outlet. One important determinant is the willingness of the various milk collection actors to support farmers in their business operations and to build trust in the milk transactions.

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